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ABSTRACT

The selection of play materials has long been of concern to parents and educators. Many play materials simply do not engage children. In this study toys were openly displayed for free selection and play within a children's recreation center. Data were collected on the subject population, toy selection and toy usage. The results indicated that children's play behavior is lawful and highly structured by the available play materials. Thus, one may accurately predict the type of play behavior which individual toys will elicit in children. (Author)

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THE ORGANIZATION OF GROUP CARE ENVIRONMENTS: TOY EVALUATION[1]

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A B S T R A C T

The selection of play materials has long been of concern to parents and educators. Many play materials simply do not engage children. In this study toys were openly displayed for free selection and play within a children's recreation center. Data were collected on the subject population, toy selection and toy usage. The results indicated that children's play behavior is lawful and highly structured by the available play materials. Thus, one may accurately predict the type of play behavior which individual toys will elicit in children.

We believe there are important advantages to having children interact, or participate, at a high rate with their environment. The environment might consist of persons, such as the teacher, or things, such as instructional or play materials. While adults can change certain aspects of their behavior to increase their reinforcing value for children, it is very difficult to modify materials in the same way. It would be helpful to predict in advance which materials would be reinforcing to children for it is naive to assume that all toys serve as reinforcers to children.

As a part of the effort to evaluate and enrich children's environments, play materials might be evaluated along with the rest of their material environment. The best toys could then be selected in order to help maintain a high rate of interaction between the children and toys. Since total evaluation is not possible, it seems reasonable to evaluate toys only along the dimension of their prime usefulness. For toys, this would obviously be the ability to attract and engage children over an extended period of time. Some will say that we should also select toys which will be educational. In the total absence of studies showing any toy to be educational, this point will have to be resolved at

some time in the future.

One system we devised to test the reinforcing value of toys for children, a toy evaluation program, consisted of a procedure whereby children were provided with a number of toys in an unrestricted play setting. Data were collected on the toys used. One obvious characteristic of highly reinforcing toys is that, according to Premack's Principle, they will be played with much more than toys which are less reinforcing.

This program was carried out in a recreation center in Kansas City, Kansas. The total recreation area was divided in half with the smaller half used for toy testing. Children came to the area voluntarily and were checked in and out. Over 125 toys have been evaluated over the past year, in this and other centers with differing child populations. The data to be presented here to exemplify our toy evaluation procedures were gathered during an 8 day period with the center open for about 3 hours daily; 73 children between the ages of 1 and 16, 44 boys and 29 girls were admitted to the center. The children spent a combined total of 9,545 child-minutes within the center.

Toys were selected from the shelves of local department stores. During this evaluation 24 toys were openly displayed for the children's choice. Each toy was individually checked out to each child. A rule of the

toy center was that a child had to return each toy that he checked out. Every five minutes an observer made observations on each toy and noted who was playing with it. Inter-observer reliability on this measure averaged 95%.

The data was then transferred to IBM cards and subjected to computer analysis. Figure 1 shows the total child-minutes of use for each of the 24 toys tested arranged in rank order. If one child played with a toy for 30 minutes (i.e: six observations), we would say that the toy accumulated 30 child-minutes of use, but if 3 children played together with a toy for 30 minutes, we would say that it accumulated 90 child-minutes of use. Thus, this overall measure is weighted toward toys which are used by more than one child. You should keep in mind that all the bar graphs to be presented will list the same toys, A through Y, in the same order they are presented here. We see that toy A, DART GUNS, accumulated about 1,000 child-minutes of use. Looking at the same graph we see that toy Y, INSTANT INSANITY, accumulated the least time, five child-minutes.

It should be pointed out that the most used toys would not necessarily be recommended toys. The DART GUN game is a good example. The possibility exists that even if a child doesn't shoot one of his friends in the

eye, he may catch a disease from him, since we note that children frequently licked the dart tip in order to make it stick better.

Figure 2 presents a bar graph of the same toys, A through Y, presented in exactly the same order as the previous use graph, only here we see the number of times that each toy was chosen. While we see that there appears to be a high correlation between this and the previous measure, we can also see that there are exceptions. Toy B, for example, 2nd in usage, is 17th in number of times chosen. Toy B happens to be LINCOLN LOGS.

Looking at the same graph, we see that toy L, SHOOT-A-LOOP, is 12th in usage, but 4th in number of times chosen. This toy, was one of our least used toys. Thus, choice may not necessarily be a good indicator of use. Figure 3 is a bar graph representing how much each toy was used by 2 or more children at once. We see that the original rankings still hold, but that toy I, FINGER PAINTS, which is 9th in overall use is 5th on this measure. Toy I was a popular item for social play, but one which presented management problems for us.

There is also another type of management problem. Toy P, STICKLERS, consisted of numerous small plastic straws which had to be correctly fitted into holes of the proper length inside the plastic container. Children

would frequently check this toy out, try for 10-15 minutes to put the straws back in, give up, and bring it back for one of the staff to reassemble. Not only was it of limited popularity with the children, this toy was decidedly unpopular with the staff!

Looking at Figure 3 again, toy L, SHOOT-A-LOOP, seems to be under represented. In fact it was used by a single child 94% of its time in use. We then carried out a manipulation to distinguish toys which would permit multiple use from toys which required multiple use. DON'T COOK YOUR GOOSE, an inexpensive table game, is frequently played by 2 or more children. They take turns placing small plastic geese on a precariously balanced lid of a play cooking pot until the top tips and all the geese fall in. This toy was set up on a table and children were given free access to it. The cumulative graph in Figure 4 represents the child-minutes for this toy. We see that it was used steadily during the first period. During the isolate period, access to the toy was limited to one child at a time, and we see that its use dropped to nearly zero. When children were again allowed free access to the toy, its rate of use quickly accelerated and recovered. Thus, such a toy might not be an appropriate toy in a family with a single child.

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Figure 5 represents the number of times that a child would play with each of these toys more than once. While our original rankings still appear to hold, you can see that toy D, DYNAMITE SHACK, appears under represented. Figure 6 shows the number of occasions that each toy was played with by a child for 10 minutes or longer, thus separating out all the short term use. Again we see that DYNAMITE SHACK seems to be under represented. While this toy is fourth in overall usage, it appears to attract large numbers of children who play with it for relatively short periods of time on only one occasion. This might be a tentative behavioral definition of a toy high in novelty value but one which produces satiation rather quickly.

Toy manufacturers are often very specific about the age of a child for which a toy is best suited. Manufacturers assure us that their own research allows them to make these statements. Our research does not allow us to be quite so firm. In Figure 7 we divided our child play population into two groups, children 8 and younger, and children 9 and older. Remember, the number of older child-minutes plus the younger child-minutes would equal our original overall use graph (Fig. 1). Toy A, DART GUNS, appeals about equally to older and younger children, while B, LINCOLN LOGS, represents 6% of the younger children's play time and 11% of the older children's play time. We

found this interesting in view of the fact that our LINCOLN LOGS came recommended for children 5-10--primarily our younger age group. Looking at the same graph we see that toy E, CONSTRUCTOSTRAWS, appears to be under represented. This toy accounted for 9% of the younger children's play time and only 3% of the older children's play time. Judging from the picture the children playing on the front of the box appear to be about 12 years old. Toy G, PLAY SKOOL'S COLORED BLOCKS, are recommended for children 1½-3 by the manufacturers, but we found them used equally by older and younger children. In evaluating toys with children of all ages and social economic groups, we have found manufacturers' recommendations on age to be consistently unreliable.

Toy manufacturers have not stressed the possible sex-related differences in children's play, but our data indicate that sex is at least as important a variable as is age in predicting toy use. Just as we divided the play time between the older and younger children, in Figure 3, we have the same play time divided between boys and girls. Remember the original 24 toys are still being presented in the order of their ranks on overall usage as in the very first graph. Toy C, WATERCOLORS, is obviously first for

girls. Our data indicate that this item accounts for 15% of the girls' play time and only 7% of the boys' play time. Looking at the same graph, we see that toy F, TINKER ZOO, appears to be under represented, suggesting heavy boy usage. Our data tell us that this toy accounted for 3% of the girls' play time and 11% of the boy's play time.

We have wondered about the relationship between a toy's price and its attractiveness to children. Figure 9 presents the original 24 toys, in their original order, with their prices. Toy B, a CLUE game, used very little, cost $4.20, while our most used toy cost 37¢, and another toy, one of intermediate use, toy K, turned out to be a box of 8 crayons costing 10¢. A product-moment correlation between price and overall usage of these 24 toys was .34. This is consistent with our experience in evaluating other toys. We have run price/usage correlations on each of the four previous 24 toy evaluations. Our mean correlation between price and use evaluations is .33.

Looking a little harder at some of our unpopular toys we found that they would be used under certain conditions. Figure 10 represents the cumulative number of child-minutes for each of 3 toys, a small model airplane, a medium size model car and a threading block. At the point labeled "prompt", the adult sitting at the toy table would hold up

the first toy to each child who approached the table for another toy and ask, "Wouldn't you like to play with this?". We see that toys 1 and 3 were used almost exclusively when their use was prompted, while toy 2, the model car, stayed in use after the prompting was discontinued. This suggests that a toy evaluation should include a period of enforced sampling for the less popular toys to ensure that their lack of use could not be simply attributed to a lack of reinforcer sampling on the part of the children.

Taking the top 5 toys from every evaluation carried out so far, we find that about 60% of these toys fall into rather clear categories:

> Construction toys; including such items as TINKER TOY, TINKER ZOO, LINCOLN LOGS, SKANETELES, CRYSTAL CLIMBERS, AMERICAN BRICKS and COLORED BLOCKS;
>
> Artistic or creative toys; including such items as CRAYONS, PLAY DOH, WATER COLORS, FINGER PAINTS and SOAP BUBBLES;
>
> Riding toys, SCOOTERS and the like, have also been consistently popular.

Parents and teachers often ask advice on the appropriate selection of toys. All too frequently they are told that in order to select toys they must "know" their child and are given to understand that toy selection is a process which depends almost completely upon the individual likes and dislikes of each child. We have tried to show you that it may be possible to select toys on a rational

basis, depending upon the general characteristics of the population to which they are intended. Children seem to be much more lawful in their play behavior than we ever anticipated.

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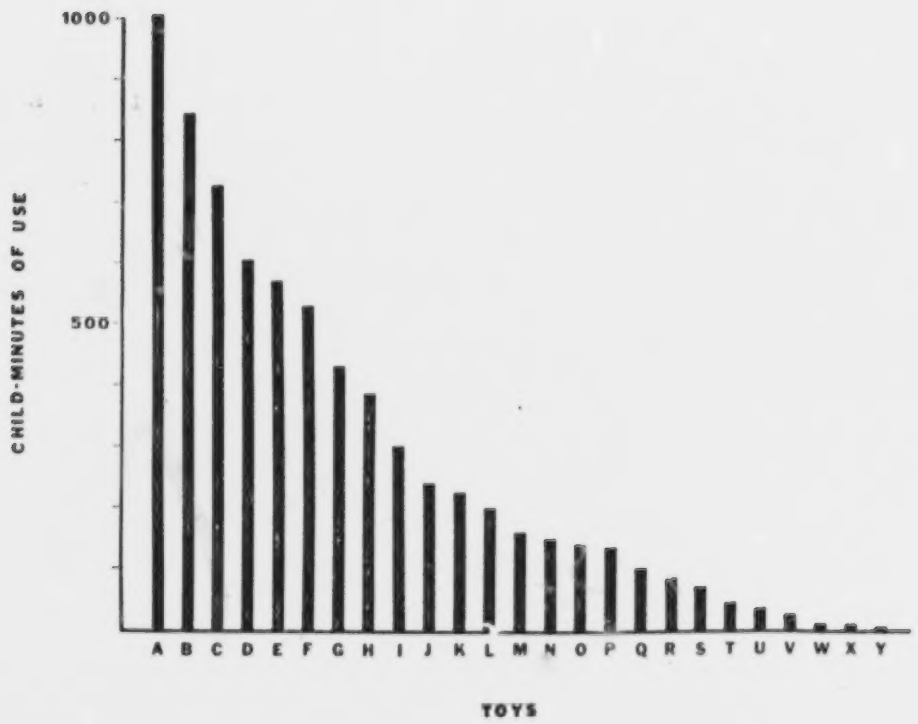

Figure 1. The total number of child-minutes of play accumulated by each of 24 toys over a seven-day toy evaluation.

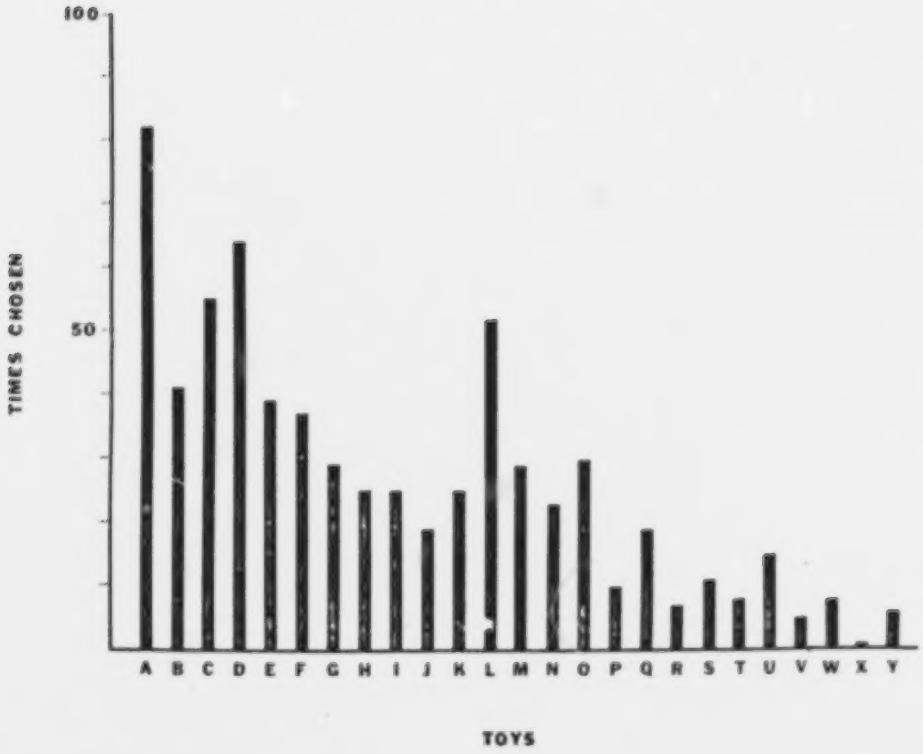

Figure 2. The total number of times that each of 24 toys was chosen for play over a seven-day toy evaluation.

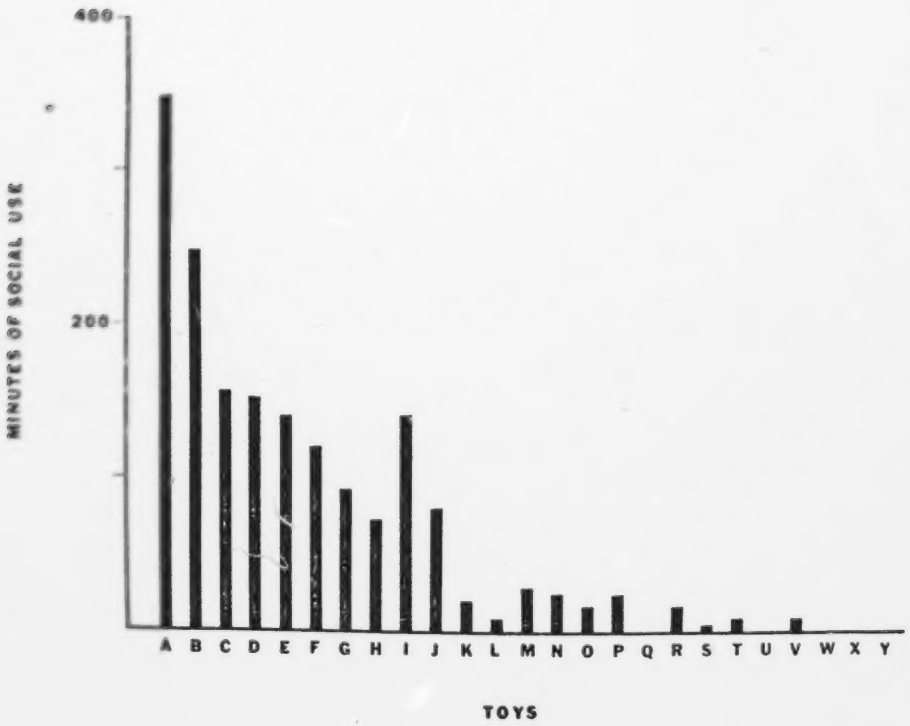

Figure 3. The total number of minutes that each of 24 toys was used by two or more children simultaneously over a seven-day toy evaluation.

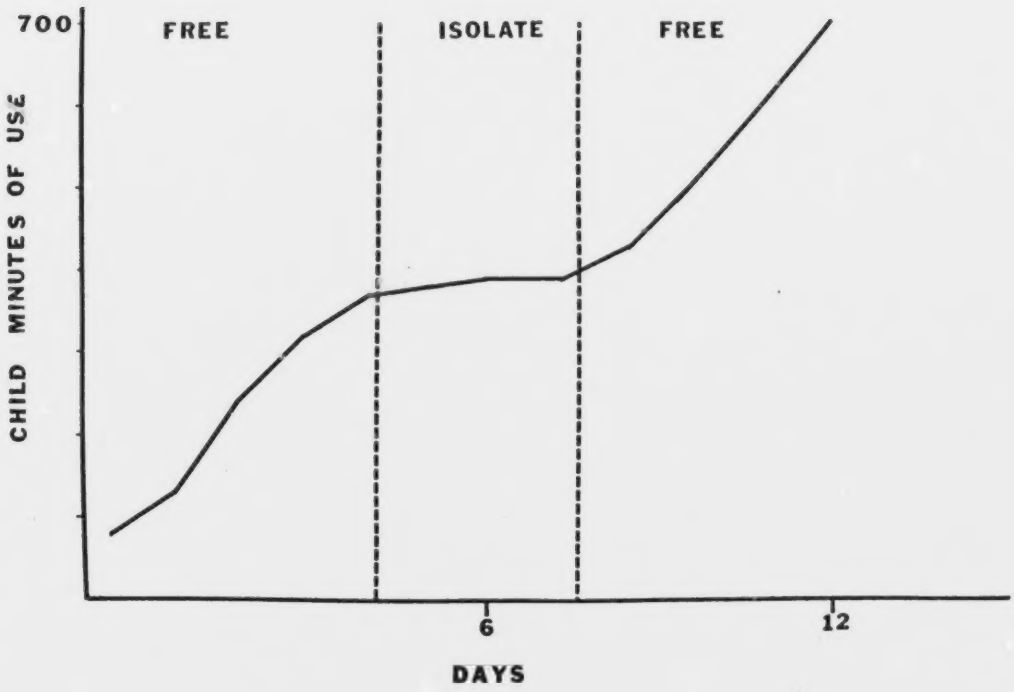

Figure 4. The cumulative number of child-minutes of use acquired by a game, Don't Cook Your Goose, while its use is unrestricted (Free) and when its use is limited to a single child at a time (Isolate).

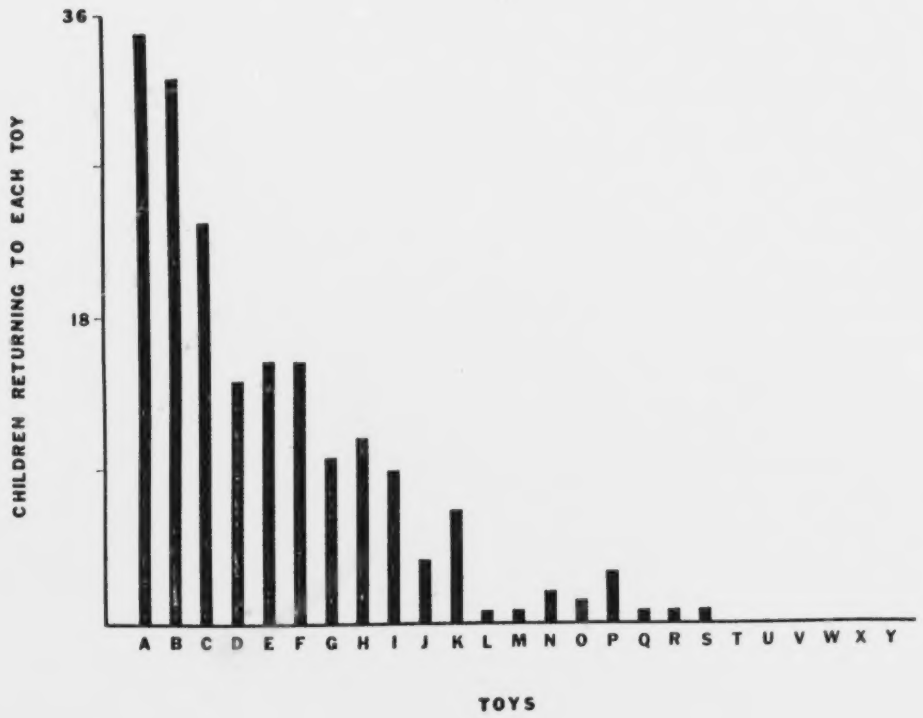

Figure 5. The total number of children who played with each of the 24 toys more than once over a seven-day toy evaluation.

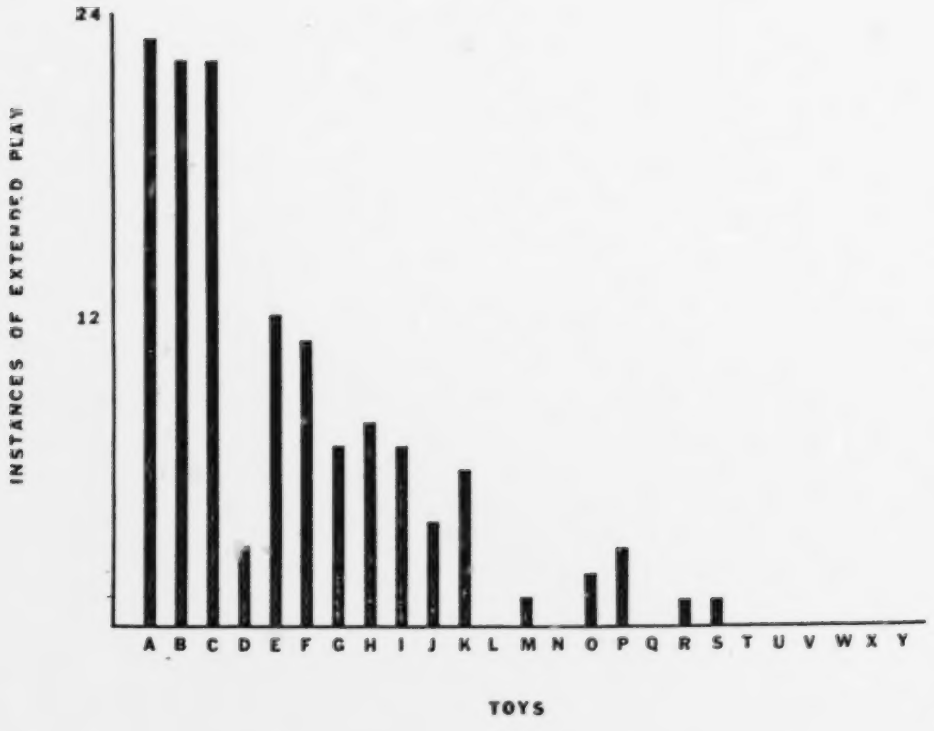

Figure 6. The number of instances that each of the 24 toys was played with for a period of 15 minutes or longer over a seven-day toy evaluation.

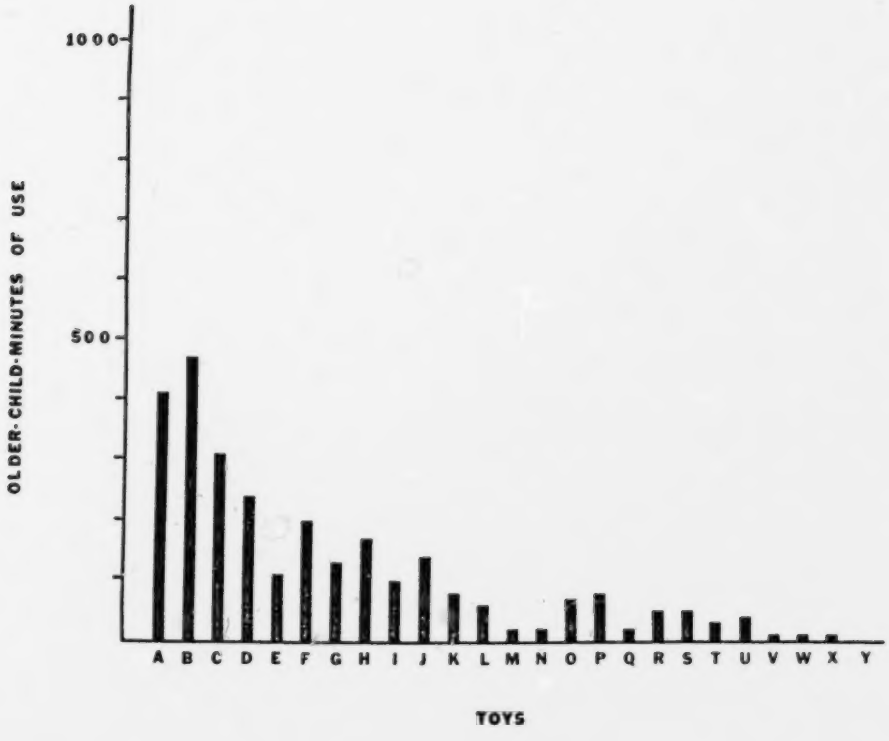

Figure 7. The total number of child-minutes of play representing children nine and older accumulated by each of the 24 toys over a seven-day toy evaluation.

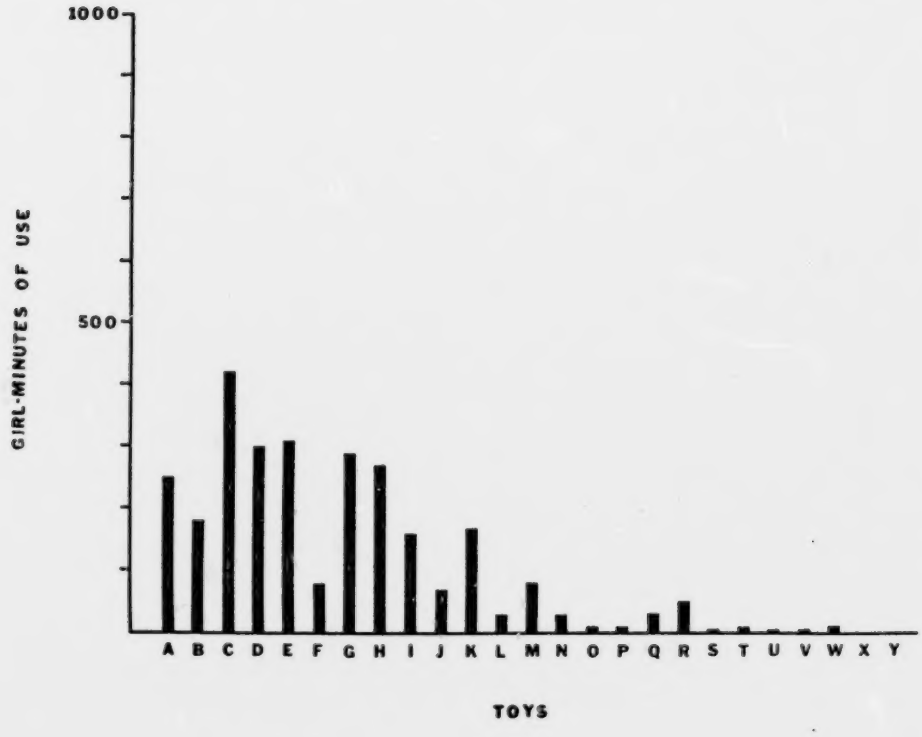

Figure 8. The total number of child-minutes of play representing girls accumulated by each of the 24 toys over a seven-day toy evaluation.

Figure 9. The retail sales price of each of the 24 toys used in the toy evaluation.

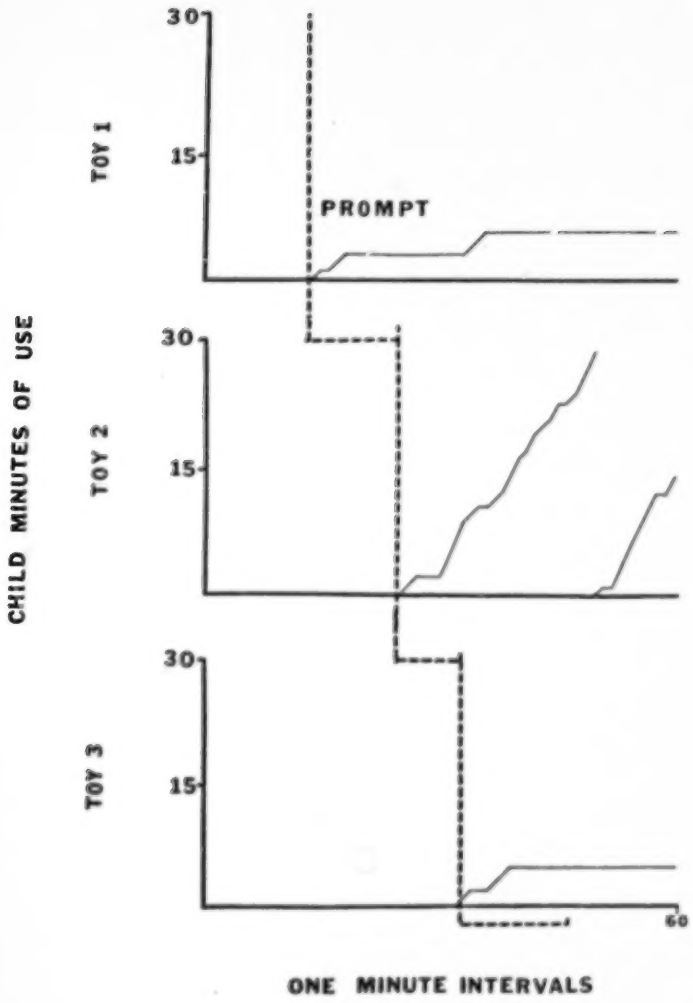

Figure 10. The cumulative number of child-minutes of use acquired by three small toys before, during, and after their use was prompted by adults.

APPENDIX

	TOY	MANUFACTURER	PRICE
A	Suction cup dart guns	Parks	$0.37
B	Lincoln Logs	Playskool	4.80
C	Water Color Set	Dri-Mark	1.60
D	Dynamite Shack	Milton Bradley	4.27
E	Construct O Straws	Parker Brothers	2.00
F	Tinkerzoo	The Toy Tinkers	1.00
G	Colored Blocks	Playskool	3.80
H	Color Neats	Matel	2.44
I	Finger Paints	Standard	.99
J	Chinese Checkers	Stevens	2.00
K	Crayons	Binney-Smith	.10
L	Shoot a Loop	Wolverine	1.50
M	Stacking Discs	Milton Bradley	2.20
N	Balloon	Oak Rubber Co.	.29
O	Labrynth puzzle	Pressman	4.80
P	Sticklers	Transogram	.60
Q	Clock Puzzle	Europlastics	3.00
R	Clue	Parker Brothers	4.20
S	The Man from Uncle Game	Milton Bradley	.80
T	Pythagoras puzzle	Kohner	.24
U	Handpuppet	---	.40
V	State Capital Game	Parker Brothers	1.20
W	Rhymes Book	Little Golden Books	.32
X	Famous Black People	Ed-U-Cards	.80
Y	Instant Insanity	Parker Brothers	.80